

CLAIMS

I Claim:

- 1 1. A method for calibrating a printing device, comprising the following
2 steps:
 - 3 (a) performing an on-media calibration, including the following substeps:
 - 4 (a.1) placing colorant on print media,
 - 5 (a.2) performing a measurement to obtain on-media calibration
6 measured values, and
 - 7 (a.3) using the on-media calibration measured values to calibrate
8 the printing device;
 - 9 (b) performing an off-media calibration to obtain off-media calibration
10 measured values, the off-media calibration being performed without placing
11 colorant on print media;
 - 12 (c) making a correlation between the on-media calibration measured
13 values and the off-media calibration measured values; and,
 - 14 (d) performing subsequent off-media calibrations in which the off-media
15 calibration measured values are used along with the correlation between the on-
16 media calibration measured values and the off-media calibration measured
17 values to calibrate the printing device.
- 1 2. A method as in claim 1 wherein in substep (a.1) the colorant is toner.
- 1 3. A method as in claim 1 wherein in substep (a.1) the colorant is ink.
- 1 4. A method as in claim 1 wherein in substep (a.2) the measurement is
2 performed using one of the following:
 - 3 a densitometer,
 - 4 a colorimeter, and
 - 5 a spectrophotometer.

1 5. A method as in claim 1 wherein substep (a.3) is performed by varying
2 print parameters of the printing device until the on-media calibration measured
3 values are substantially equal to target measure values.

1 6. A method as in claim 1 wherein step (b) includes the following
2 substeps:

3 (b.1) placing colorant on a transportation belt of the printing device; and,
4 (b.2) performing a measurement of the colorant on the transportation belt
5 to obtain the off-media calibration measured values.

1 7. A method as in claim 1 wherein in substep (a.1) colorant is placed on
2 the print media in half-toned patches.

1 8. A method as in claim 7 wherein step (b) includes the following
2 substeps:

3 (b.1) placing colorant on a transportation belt of the printing device, the
4 placed colorant being arranged in half-toned patches that correspond to the half-
5 toned patches placed in substep (a.1); and,

6 (b.2) performing a measurement of the colorant on the transportation belt
7 to obtain the off-media calibration measured values.

1 9. A self-calibrating printing device, comprising:
2 a printer transportation belt for transporting print media;
3 a marking engine for in the course of normal printing placing colorant on
4 print media, the marking engine also for placing colorant on the print media
5 during on-media calibration and for placing colorant on the printer
6 transportation belt during off-media calibration; and,
7 a sensing device, wherein during on-media calibration, the sensing device
8 performs a measurement to obtain on-media calibration measured values, and
9 wherein during of-media calibration, the sensing device performs a measurement
10 to obtain off-media calibration measured values;

11 wherein the self-calibrating printing device uses the on-media calibration
12 measured values to calibrate the printing device;

13 wherein the self-calibrating printing device makes a correlation between
14 the on-media calibration measured values and the off-media calibration
15 measured values; and,

16 wherein, during subsequent off-media calibrations the self-calibrating
17 printing device uses the off-media calibration measured values along with the
18 correlation between the on-media calibration measured values and the off-media
19 calibration measured values to calibrate the printing device.

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21 10. A self-calibrating printing device as in claim 9 wherein the colorant is
22 toner.

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24 11. A self-calibrating printing device as in claim 9 wherein the colorant is
25 ink.

26
27 12. A self-calibrating printing device as in claim 9 wherein the sensor
28 comprises one of the following:

29 a densitometer,

30 a colorimeter,

31 a spectrophotometer.

32
33 13. A self-calibrating printing device as in claim 9 wherein during on-
34 media calibration, the printing device varies print parameters until the on-media
35 calibration measured values are substantially equal to target measure values.

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37 14. A self-calibrating printing device as in claim 9 wherein during on-
38 media calibration, the marking engine places colorant on the print media in half-
39 toned patches.

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41 15. A self-calibrating printing device as in claim 14 wherein during off-
42 media calibration, the colorant placed on the transportation belt is arranged in

3 half-toned patches that correspond to the half-toned patches placed on the print
4 media during on-media calibration.

1 16. A self-calibrating printing device as in claim 9 wherein the sensing
2 device comprises a plurality of sensors.

1 17. A printing device, comprising:
2 a colorant placing engine for in the course of normal printing placing
3 colorant on print media, the colorant placing engine also for placing colorant on
4 the print media during on-media calibration; and,
5 a sensing device, wherein during on-media calibration, the sensing device
6 performs a measurement to obtain on-media calibration measured values;
7 wherein the printing device uses the on-media calibration measured
8 values to calibrate the printing device;
9 wherein the printing device makes a correlation between the on-media
10 calibration measured values and off-media calibration measured values
11 calculated during an initial off-media calibration cycle; and,
12 wherein, during subsequent off-media calibration cycles the printing
13 device uses the off-media calibration measured values along with the correlation
14 between the on-media calibration measured values and the off-media calibration
15 measured values to calibrate the printing device.

1 18. A printing device as in claim 17 wherein the sensor comprises one of
2 the following:
3 a densitometer,
4 a colorimeter,
5 a spectrophotometer.

1 19. A printing device as in claim 17 wherein during on-media calibration,
2 the printing device varies print parameters until the on-media calibration
3 measured values are substantially equal to target measure values.

1 20. A printing device as in claim 17 wherein during on-media calibration,
2 the colorant placing engine places colorant on the print media in half-toned
3 patches.

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